Claims:

1. A turbine shroud assembly cooling element comprising:

an arcuate panel circumscribed about an axis of rotation and having opposite axially spaced apart forward and aft ends,

a plurality of cooling apertures extending through the panel,

an axially extending midline of the panel parallel to the axis of rotation,

a symmetric portion of the cooling apertures having a symmetrical density of aperture inlets that is symmetric with respect to the axially extending midline, and

an asymmetric portion of the cooling apertures having an asymmetrical density of aperture inlets that is asymmetric with respect to the axially extending midline.

2. A cooling element as claimed in Claim 1 further comprising a high density area of the cooling apertures in the asymmetric portion of the cooling apertures and the high density area having a higher density of aperture inlets than in the symmetric portion of the cooling apertures.

3. A cooling element as claimed in Claim 2 further comprising a low density area of the cooling apertures in the asymmetric portion of the cooling apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the cooling apertures.

4. A cooling element as claimed in Claim 1 further comprising the high density area of the cooling apertures located in a wake region of the arcuate panel.

5. A cooling element as claimed in Claim 4 further comprising a high density area of the cooling apertures in the asymmetric portion of the cooling apertures and the high density area having a higher density of aperture inlets than in the symmetric portion of the cooling apertures.

6. A cooling element as claimed in Claim 5 further comprising a low density area of the cooling apertures in the asymmetric portion of the cooling apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the cooling apertures.

7. A cooling element as claimed in Claim 1 wherein the cooling element is a baffle and the cooling apertures are impingement apertures.

8. A cooling element as claimed in Claim 7 further comprising a high density area of the impingement apertures in the asymmetric portion of the impingement apertures and the high density area having a higher density of aperture inlets than in the symmetric portion of the impingement apertures.

9. A cooling element as claimed in Claim 8 further comprising a low density area of the impingement apertures in the asymmetric portion of the impingement apertures and the low density area having a lower density of aperture inlets than in the

symmetric portion of the impingement apertures.

10. A cooling element as claimed in Claim 1 wherein the cooling element is a shroud segment, the arcuate panel is a base, and the cooling apertures are convection cooling apertures.

11. A cooling element as claimed in Claim 10 further comprising a high density area of the impingement cooling apertures in the asymmetric portion of the convection cooling apertures and the high density area having a higher density of aperture inlets than in the symmetric portion of the convection cooling apertures.

12. A cooling element as claimed in Claim 11 further comprising a low density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the convection cooling apertures.

13. A cooling element as claimed in Claim 10 further comprising the high density area of the convection cooling apertures located in a wake region of the arcuate panel of the shroud segment.

14. A cooling element as claimed in Claim 13 further comprising a high density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the high density area having a higher density of aperture inlets than in the symmetric portion of the convection cooling apertures.

15. A cooling element as claimed in Claim 14 further comprising a low density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the convection cooling apertures.

16. A cooling element as claimed in Claim 15 wherein at least a first portion of the convection cooling apertures are axially angled forwardly with respect to the axis of rotation.

17. A cooling element as claimed in Claim 16 wherein a second portion of the convection cooling apertures are axially angled rearwardly with respect to the axis of rotation.

18. A cooling element as claimed in Claim 17 wherein a third portion of the convection cooling apertures are circumferentially angled in a clockwise direction with respect to the midline of the base.

19. A cooling element as claimed in Claim 17 wherein a fourth portion of the convection cooling apertures are circumferentially angled in a counter-clockwise direction with respect to the midline of the base.

20. A turbine shroud assembly comprising:

a plurality of arcuate shroud segments circumferentially disposed about an engine centerline axis,

each of the shroud segments including a base having a radially outer back surface, a radially

inner front surface, and opposite axially spaced apart upstream and downstream ends,

a plurality of angled elongated convection cooling apertures extending through the base with convection aperture inlets at the back surface and aperture outlets at the radially inner front surface,

a plurality of arcuate hanger segments supporting the shroud segments and secured to a gas turbine engine outer casing,

a shroud chamber radially disposed between each of the hanger segments and bases,

a pan-shaped baffle radially disposed in the shroud chamber between each of the hanger segments and bases and defining a baffle plenum in the shroud chamber and radially outwardly of the baffle,

at least one metering hole disposed through each of the hanger segments and leading to the baffle plenum,

a plurality of impingement apertures having impingement aperture inlets through a panel of the baffle and generally oriented towards the base, the panel being radially spaced apart from and generally concentric with the base,

parallel axially extending midlines of the panel and the base, the midlines being parallel to the engine centerline axis, and

asymmetric portions of the cooling apertures having asymmetrical densities of aperture inlets that are symmetric with respect to the axially extending midlines.

21. An assembly as claimed in Claim 20 further comprising a high density area of the impingement apertures in the asymmetric portion of the impingement apertures and the high density area

having a higher density of aperture inlets than in the symmetric portion of the impingement apertures.

22. An assembly as claimed in Claim 21 further comprising a low density area of the impingement apertures in the asymmetric portion of the impingement apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the impingement apertures.

23. An assembly as claimed in Claim 20 further comprising a high density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the high density area having a higher density of aperture inlets than in the symmetric portion of the convection cooling apertures.

24. An assembly as claimed in Claim 23 further comprising a low density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the convection cooling apertures.

25. An assembly as claimed in Claim 20 further comprising the high density area of the convection cooling apertures located in a wake region of the arcuate panel of the shroud segment.

26. An assembly as claimed in Claim 25 further comprising a high density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the high density

area having a higher density of aperture inlets than in the symmetric portion of the convection cooling apertures.

27. An assembly as claimed in Claim 26 further comprising a low density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the convection cooling apertures.

28. An assembly as claimed in Claim 27 wherein at least a first portion of the convection cooling apertures are axially angled upstream.

29. An assembly as claimed in Claim 28 wherein a second portion of the convection cooling apertures are axially angled downstream.

30. An assembly as claimed in Claim 25 further comprising a high density area of the impingement apertures in the asymmetric portion of the impingement apertures and the high density area having a higher density of aperture inlets than in the symmetric portion of the impingement apertures.

31. An assembly as claimed in Claim 30 further comprising a low density area of the impingement apertures in the asymmetric portion of the impingement apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the impingement apertures.

32. An assembly as claimed in Claim 31 further comprising a high density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the high density area having a higher density of aperture inlets than in the symmetric portion of the convection cooling apertures.

33. An assembly as claimed in Claim 32 further comprising a low density area of the convection cooling apertures in the asymmetric portion of the convection cooling apertures and the low density area having a lower density of aperture inlets than in the symmetric portion of the convection cooling apertures.

34. An assembly as claimed in Claim 33 wherein at least a first portion of the convection cooling apertures are axially angled upstream.

35. An assembly as claimed in Claim 34 further comprising the high density area of the impingement apertures located radially outwardly and circumferentially aligned with the convection cooling apertures located in the wake region of the shroud segment.